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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte BRIAN POPE and ZHAN LIU

Appeal 2010-000694
Application 10/700,738
Technology Center 3700

Before KEN B. BARRETT, GAY ANN SPAHN, and
MICHAEL C. ASTORINO, *Administrative Patent Judges*.

ASTORINO, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

The Appellants appeal under 35 U.S.C. § 134 from the Examiner's decision finally rejecting claims 1-3, 5-36, and 46-80. More specifically, claims 1-3, 5-31, 46-67, 72-74, and 78 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Jhuboo (US 5,501,665, iss. Mar. 26, 1996)¹;

claims 32, 34, 36, 68, 70, 76, 77, and 80 are rejected under § 103(a) as being unpatentable over Jhuboo and Tribe (US 2003/0205587 A1, publ. Nov. 6, 2003); and

claims 33, 35, 69, 71, 75, and 79 are rejected under § 103(a) as being unpatentable over Jhuboo and Moberg (US 6,485,465 B2, iss. Nov. 26, 2002).

Claims 4, 37-45, and 81-85 are cancelled. App. Br. 30, 36, and 45. We have jurisdiction over the appeal under 35 U.S.C. § 6(b).

We REVERSE.

THE INVENTION

Claim 13, reproduced below with italics added, is representative of the subject matter on appeal.

13. A method of automatically detecting an occlusion in a fluid line of a medical pumping system, the fluid line being configured to carry

¹ There is an error in this ground of rejection in the Examiner's Answer. Ans. 3. The Examiner recites that the claims are "anticipated by," instead of "unpatentable over," Jhuboo under 35 U.S.C. § 103(a). The Appellants appear to understand that this was merely an oversight as the grounds of rejection to be reviewed on appeal for claims 1-3, 5-31, 46-67, 72-74, and 78 provide the correct terminology, i.e., "unpatentable over". App. Br. 12.

fluid under pressure between a fluid source and a patient, the method comprising:

during a pumping sequence, determining a first instantaneous force value F1 indicative of force in the fluid line at instantaneous time T1;

during the pumping sequence, determining a second instantaneous force value F2 indicative of force in the fluid line at instantaneous time T2; and

providing an indication of the occlusion *if a slope calculated by dividing a difference between the second instantaneous force value F2 and the first instantaneous force value F1 by a difference between instantaneous time T1 and instantaneous time T2 departs from an expected slope relationship.*

Independent claims 1, 46, 55, 74, and 78 contain the same or similar limitations as the italicized portion of claim 13.

ANALYSIS

The rejection of claims 1-3, 5-31, 46-67, 72-74, and 78 as being unpatentable over Jhuboo

Jhuboo discloses providing medication through a perfusion line to a patient via a syringe pump 8. Col. 1, ll. 8-17, col. 2, ll. 66, 67, and fig. 2. The syringe pump 8 includes a force sensor 36 that provides a signal via connection point 60 to microprocessor 46. Col. 3, ll. 17, 42-47, 60-67, and figs. 4, 6. Using the force measured by the force sensor 36, the microprocessor 46 calculates pressure inside the syringe 12. Col. 4, ll. 1-5. A microprocessor 46 uses a program in memory 50 to generate an alarm when the calculated pressure in the syringe exceeds a pressure value. Col. 4, ll. 22-29. The alarm is representative of an obstruction or an occlusion, e.g.,

in the perfusion line, which if not detected may cause injury to a patient. *See* col. 1, ll. 1-17, col. 4, ll. 22-29.

Jhuboo discloses that is known in the art that the stored pressure value can be an instantaneous pressure, or a mean pressure after a stabilization time. The instantaneous pressure or the mean pressure is compared to a fixed level, which can require a relatively long interval and/or result in false alarms. *See* col. 1, ll. 15-33. Jhuboo's invention is directed to calculating a gradient of a pressure-time curve, i.e., a mean slope, and comparing the mean slope to a predetermined gradient or slope indicative of an obstruction. *See* col. 4, ll. 49 - col. 5, l. 5, and fig. 7; *see also* App. Br. 22-24.

The Examiner finds that force and pressure are interchangeable, and that "Jhuboo does not disclose using 'instantaneous force values' in his [slope] equations." Ans. 3; *see also* Spec. 18, para [0053] ("For purposes of this specification, 'force' and 'pressure' may be used interchangeably.").

The Examiner concludes (Ans. 4) that:

[o]ne of ordinary skill in the art at the time the invention was made would have expected the method of Jhuboo [i.e., using mean slope for pressure] to perform equally well using an instantaneous force value since Jhuboo discloses that it would react faster to an obstruction.

The Examiner's conclusion of obviousness is premised on the finding that "Jhuboo suggests using an instantaneous force at Col 5, lines 40-52 and that it is known in the art to use either mean or instant force values to determine occlusions, Col 1 line 15-30." Ans. 3-4. However, Jhuboo's disclosure at column 5, lines 40-52 does not suggest instantaneous force, only that the mean pressures can be calculated over smaller changes in time; and Jhuboo's disclosure at column 1, lines 15-30 only suggests comparing pressures

(mean or instantaneous) against a fixed value not a slope. *See also* App. Br. 22-24.

Thus, the Appellants correctly contend that Jhuboo does not suggest using instantaneous forces at instantaneous times to determine a slope that departs from an expected slope relationship or deviation from an expected value. App. Br. 22-24. We reverse the rejection of independent claims 1, 13, 46, 55, 74, and 78 as being unpatentable over Jhuboo. As we reverse the rejection of independent claims 1, 13, 46, and 55, we also reverse the rejection of their dependent claims 2, 3, 5-12, 14-31, 47-54, 56-67, 72, and 73 for the same reason.

The rejection of claims 32, 34, 36, 68, 70, 76, 77, and 80 as being unpatentable over Jhuboo and Tribe

Turning to the rejection of claims 32, 34, 36, 68, 70, 76, 77, and 80, the Examiner finds “Tribe teaches that an automatic syringe pump can be controlled by an occlusion detector to reverse the flow rate and require manual restart of the pump after an occlusion has occurred (P0005-0009).” Ans. 5. The Examiner’s finding with respect to Tribe does not remedy the deficiencies of the Examiner’s evidence and technical reasoning as pointed out in connection with the rejection of independent claims 13, 55, 74, and 78. In view of the foregoing, we do not sustain the Examiner’s rejection of claims 32, 34, 36, 68, 70, 76, 77, and 80, which ultimately depend from one of independent claims 13, 55, 74, and 78, under § 103(a) as being unpatentable over Jhuboo and Tribe.

The rejection of claims 33, 35, 69, 71, 75, and 79 as being unpatentable over Jhuboo and Moberg

Turning to the rejection of claims 33, 35, 69, 71, 75, and 79, the Examiner finds “Moberg teaches an infusion pump (101) and force occlusion detector (134). Moberg teaches that the occlusion detector automatically responds to force greater than the maximum allowable bolus delivery (Col 6 3rd paragraph).” Ans. 6. The Examiner’s finding with respect to Moberg does not remedy the deficiencies of the Examiner’s evidence and technical reasoning as pointed out in connection with the rejection of independent claims 13, 55, 74, and 78. In view of the foregoing, we do not sustain the Examiner’s rejection of claims 33, 35, 69, 71, 75, and 79, which ultimately depend from one of independent claims 13, 55, 74, and 78, under § 103(a) as being unpatentable over Jhuboo and Moberg.

DECISION

We REVERSE the Examiner’s decision finally rejecting claims 1-3, 5-36, and 46-80.

REVERSED

klh/nlk